CLAIMS 

1. A blood treatment device having a blood purification element (1), divided into two chambers by a semipermeable membrane (2), whose first chamber (3) is part of a dialysis fluid loop and whose second chamber (4) is part of an extracorporeal blood loop,

having a dialysis fluid supply line for supplying fresh dialysis fluid to the first chamber (3) and/or into the blood loop,

having a dialysis removal line for removing used dialysis fluid from the first chamber (3),

having a control unit (34) for controlling the blood treatment device,

having an analysis unit (33),

having at least one sensor (27, 28), connected to the analysis unit (33), on at least one of the blood loop or dialysis fluid loop to detect the concentration of a first material which may penetrate the semipermeable membrane (2),

the analysis unit (33) being capable of determining the blood purification performance L1 of the blood purification element for the first material on the basis of the measurement values of the at least one sensor (27, 28),

characterized in that

the analysis unit (33) is also capable of determining the blood purification performance L2

of the blood purification element for a second material, which is different from the blood purification performance L1 for the first material, on the basis of the blood purification performance L1 for the first material.

2. The blood treatment device according to Claim 1, characterized in that the blood purification performance L is the effective dialysis Deff.

3. The blood treatment device according to Claim 2, characterized in that the analysis unit (33) is capable of deriving an effective mass exchange coefficient k0A1eff from the measured dialysance D1eff for the first material, of determining the effective mass exchange coefficient k0A2eff for the second material from the stored ratio f between the theoretical mass exchange coefficient k0A2th of the second material and the theoretical mass exchange coefficient k0A1th of the first material by multiplying with k0A1eff, and of deriving the effective dialysance D2eff for the second material from k0A2eff.

4. The blood treatment device according to Claim 2, characterized in that the analysis unit (33) is capable of deriving, from the stored theoretical mass exchange coefficients k0A1th for the first material and k0A1th for the second material, values corresponding thereto for the theoretical dialysances D1th and D2th and of determining the effective dialysance D2eff for the second material from the measured dialysance D1eff for the first material multiplied by the ratio D2th to D1th.

5. The blood treatment device according to one of the preceding claims, characterized in that the at

least one sensor is a first upstream sensor (28) on the dialysis fluid removal line (8a) for measuring the concentration of the first material in the used dialysis fluid.

6. The blood treatment device according to Claim 5, characterized in that it also includes a dialysis fluid preparation unit (11), which is connected to the control unit (34).

7. The blood treatment device according to Claim 6, characterized in that the analysis unit (33) and the control unit (34) are capable of determining the blood purification performance L1 for the first material through the following method:

storage of the concentration C1di1 of the first material in the fresh dialysis fluid in the analysis unit (33),

measurement of the concentration C1do1 of the first material in the used dialysis fluid using the first downstream sensor (28) and storage of C1do1 in the analysis unit (33),

alteration of the concentration C1di of the first material in the fresh dialysis fluid by the dialysis fluid preparation unit (11) at the command of the control unit (34),

storage of the changed concentration C1di2 of the first material in the fresh dialysis fluid in the analysis unit (33),

measurement of the changed concentration C1do2 of the first material in the used dialysis fluid

using the first downstream sensor (28) and storage of C1do2 in the analysis unit (33), and

determination by the analysis unit (33) of the blood purification performance L1 on the basis of the concentrations C1di1, C1do1 and changed concentrations C1di2, C1do2 of the first material in the fresh and used dialysis fluid.

8. The blood treatment device according to Claim 7, characterized in that the dialysis fluid preparation unit (11) performs the change of the concentration C1di in the form of a step or bolus.

9. The blood treatment device according to Claim 7, characterized in that it also includes a first upstream sensor (27), connected to the analysis unit (33) and placed on the dialysis fluid supply line (7b), for measuring the concentrations C1di1 and C1di2 in the fresh dialysis fluid.

10. The blood treatment device according to one of the preceding claims, characterized in that it also includes a second downstream sensor (48), connected to the analysis unit (33) and placed on the dialysis fluid removal line (8a), for measuring the concentration C2do of the second material in the used dialysis fluid.

11. The blood treatment device according to Claim 10, characterized in that the analysis unit (33) is capable of determining the concentration C2bi of the second material in the blood flowing to the second chamber (4) on the basis of the measured concentration C2do of the second material in the used dialysis fluid and the stored concentration C2di of the second material in the fresh dialysis

fluid and the established blood purification performance L2 of the second material.

12. The blood treatment device according to one of the preceding claims, characterized in that the first material is sodium.

13. The blood treatment device according to one of the preceding claims, characterized in that the second material is potassium, glucose, creatinine, calcium, or phosphate.